



Scheme of Studies

BS Statistics and Data Analytical Science

Department of Statistics and Data Analytical Sciences

Faculty of Basic & Applied Sciences

Spring 2026

(Applicable from Fall 2025 intake)

BS Statistics and Data Analytical Science

Title of the program

BS in Statistics and Data Analytical Science

Academic Department

Department of Statistics and Data Analytical Sciences, Faculty of Basic and Applied Sciences

Proposed Inception Term

Fall 2025

Eligibility Criteria

HSSC from any BISE with at least 50 % marks

OR

An examination equivalent to the Intermediate and having an Equivalent Certificate issued by the Inter Board Chairman Committee, Islamabad

HSSC Pre-Medical are allowed admission with condition to take one additional course of 4 credit hours.

Program Duration

Minimum 4 Years and Maximum 6 Years

Minimum 8 semesters and Maximum 12 semesters

Program Structure

The BS program in Statistics and data analytical science is based on four years of education after higher secondary school. In the first two years, students will be offered General Education courses, core courses of Statistics and Data Analytics along with some interdisciplinary and allied courses. After two years, the students will take advanced courses from Statistics and Data Analytical Science. While designing the curriculum for this proposed program, the guidelines of Higher Education Commission (HEC) as per the UGE policy 2023 have been considered.

Overview of BS Statistics and Data Analytical Science

S. No.	Domain		No. of Courses	No. of Credit Hours
1	General Education		15	34
2	Interdisciplinary Allied Courses		4	12
3	Major Courses	Statistics	13	81
		Data Analytical Science	14	
4	Internship			03
5	Capstone Project			03
			46	133

General Education Courses

S. No.	Course Code	Course Title	Cr Hrs.	No. of Courses	Subcategory
1	PY 115	Introduction to Psychology	2-0-2	1	Arts & Humanities
2	PH 112	Introduction to Environmental Science	3-0-3	1	Natural Sciences
3	BA 152	Introduction to Management	2-0-2	1	Social Sciences
4	EL 170	Functional English	3-0-3	1	Functional English
5	EL 271	Expository Writing	3-0-3	1	Expository Writing
6	HU 124	Islamic Studies and Ethics	2-0-2	1	Islamic Studies
7	HU 405	Ideology and Constitution of Pakistan	2-0-2	1	Ideology and Constitution of Pakistan
8	HU 115	Pakistan Studies	2-0-2	1	Pakistan Studies
9	CS 181	Applications of Information and Communication Technologies	2-0-2	1	Applications of Information and Communication Technologies (ICT)
	CS 181 L	Applications of Information and Communication Technologies Lab	0-1-1		
10	MA 116	Single Variable Calculus	3-0-3	2	Quantitative Reasoning
11	MA 105	Multivariable Calculus	3-0-3		
12	BA 353	Entrepreneurship	2-0-2	1	Entrepreneurship
13	HU 411	Civics and Community Engagements	2-0-2	1	Civics and Community Engagement
14	FQ 100	Fehm-e-Quran I	1-0-1	1	
15	FQ 101	Fehm-e-Quran II	1-0-1	1	
	Total		33-1-34	15	

Interdisciplinary Allied Courses

S. No.	Course Code	Course Title	Cr Hrs.
1	MA 201	Linear Algebra	3-0-3
2	MA 478	Graph Theory	3-0-3
3	CS 218	Advanced Programming	2-0-2
	CS 218 L	Advanced Programming Lab	0-1-1
4	CS 217	Applied Data Structures	2-0-2
	CS 217 L	Applied Data Structures Lab	0-1-1
	Total		10-2-12

Internship

S. No.	Course Code	Course Title	Cr Hrs.
1	SD 490	Internship	3-0-3

Capstone Project

S. No.	Course Code	Course Title	Cr Hrs.
1	SD 498	Capstone Project-I	1-0-1
2	SD 499	Capstone Project-II	2-0-2

List of Major courses

Category	Sub-Category	Course Code	Course Title	Cr Hrs.
Statistics and Data Analytical Science	Statistics	SD 111	Introduction to Statistics	3-0-3
		SD 112	Fundamentals of Probability Theory	3-0-3
		SD 222	Introduction to Sampling and Sampling Distribution	3-0-3
		SD 332	Estimation Theory	3-0-3
		SD 334	Hypothesis Testing	3-0-3
		SD 348	Statistical Modelling: Linear & Generalized Linear Models	3-0-3
		SD 246	Applied Econometrics	3-0-3
		SD 244	Bio Statistics and Population Analytics	3-0-3
		SD 344	Multivariate Data Analytics	3-0-3
		SD 336	Bayesian Inference and Computational Methods	3-0-3
	Data Analytical Science	SD 277	Data Warehousing	2-0-2
		SD 277 L	Data Warehousing Lab	0-1-1
		SD 172	Foundations of Data Analytics	2-0-2
		SD 172 L	Foundations of Data Analytics Lab	0-1-1
		SD 276	Fundamentals of Artificial Intelligence	2-0-2
		SD 276 L	Fundamentals of Artificial Intelligence Lab	0-1-1
		SD 375	Data Mining and Predictive Analytics	2-0-2
		SD 375 L	Data Mining and Predictive Analytics Lab	0-1-1
		SD 478	Cloud Computing for Data Science	2-0-2
		SD 478 L	Cloud Computing for Data Science Lab	0-1-1
		SD 263	Exploratory Data Analytics and Visualization	2-0-2
		SD 263 L	Exploratory Data Analytics and Visualization Lab	0-1-1
		SD 366	Machine Learning for Data Analytics	2-0-2
		SD 366 L	Machine Learning for Data Analytics Lab	0-1-1
		SD 467	Deep Learning for Data Analytics	2-0-2
		SD 467 L	Deep Learning for Data Analytics Lab	0-1-1

		SD 165	Statistical Tools and Analytics Programming	2-0-2
		SD 165 L	Statistical Tools and Analytics Programming Lab	0-1-1
		SD 445	Climate Analytics using GIS Data	2-0-2
		SD 445 L	Climate Analytics using GIS Data Lab	0-1-1
	Electives	SD 3xx	Elective I	3-0-3
		SD 4xx	Elective II	3-0-3
		SD 4xx	Elective III	x-x-3
		SD 4xx	Elective IV	x-x-3
		SD-4xx	Elective V	x-x-3
		SD-4xx	Elective VI	x-x-3
		SD-4xx	Elective VII	x-x-3
		Total		81

List of Electives

S. No.	Category	Course Code	Course Title	Cr Hrs.	
1	Statistics	SD 444	Applied Structural Equation Modelling	3-0-3	
2		SD 455	Reliability Analytics	3-0-3	
3		SD 446	Survival Analytics	3-0-3	
4		SD 456	Actuarial Statistics	3-0-3	
5		SD 447	Environmental Statistics	3-0-3	
6		SD 433	Non-Parametric Statistics	3-0-3	
7		SD 454	Financial and Energy Market Data Analytics	3-0-3	
8		SD 475	Coding and Cryptography	2-0-2	
		SD 475 L	Coding and Cryptography Lab	0-1-1	
9		SD 436	Statistical Quality Control for Data Analytics	2-0-2	
		SD 436 L	Statistical Quality Control for Data Analytics Lab	0-1-1	
10		SD 347	Applied Time Series Analytics	3-0-3	
11		SD 435	Design of Experiments and Analytics	3-0-3	
12		SD 466	High Dimensional Statistics	3-0-3	
		SD 423	Questionnaire Design and Survey Methodology	3-0-3	
13		SD 345	Epidemiology	3-0-3	
14		SD 458	Design and Analytics of Medical Studies	3-0-3	
15	SD 346	Pharmaceutical Statistics	3-0-3		
16	SD 457	Clinical Trials	3-0-3		
17	SD 434	Robust Statistics	3-0-3		
1	Data Analytical Science	SD 476	GUIs Basics for Data Analytics	2-0-2	
		SD 476 L	GUIs Basics for Data Analytics Lab	0-1-1	
		2	SD 464	Reporting Solutions with Analytics	3-0-3
			SD 477	Software Engineering for Data Science	3-0-3
		3	SD 365	Digital Image Processing for Data Analytics	2-0-2
			SD 365 L	Digital Image Processing for Data Analytics Lab	0-1-1
		4	DS 351	Natural Language Processing	2-0-2
			DS 351 L	Natural Language Processing Lab	0-1-1

5		SD 468	Platforms and Architecture for Data Analytics	2-0-2
		SD 468 L	Platforms and Architecture for Data Analytics Lab	0-1-1
6		SD 360	Data Visualization for Data Science	2-0-2
		SD 360 L	Data Visualization for Data Science Lab	0-1-1
7		DS 470	Speech Processing	2-0-2
		DS 470 L	Speech Processing Lab	0-1-1
8		CS 426	Parallel and Distributed Computing	2-0-2
		CS 426 L	Parallel and Distributed Computing Lab	0-1-1
9		IT 352	Virtual Systems and Services	2-0-2
		IT 352 L	Virtual Systems and Services Lab	0-1-1
10		DS 451	Text Mining	2-0-2
		DS 451 L	Text Mining Lab	0-1-1
11		AI 435	Reinforcement Learning	3-0-3
12		SD 465	Categorical Data Analytics	3-0-3
13		SD 464	Analysis of Repeated Measurements	3-0-3
14		SD 361	Functional Data Analysis	3-0-3
15		SD 354	Applied Optimization and Decision Analytics	3-0-3
16		AI 433	Artificial Neural Networks	2-0-2
		AI 433 L	Artificial Neural Networks Lab	0-1-1
17		AI 440	Professional Practices and Ethics in Artificial Intelligence	3-0-3
18		SD 442	Edge Computing for Data Analytics	3-0-3

BSSDAS-Scheme of Studies

1 st Semester				
Course Code	Course Title	Pre-req.	Cr. Hr.	Domain
MA 100	Foundational Mathematics		4-0-4*	Non Credit
SD 111	Introduction to Statistics		3-0-3	Major 1
MA 116	Single Variable Calculus		3-0-3	GE-QR-1
BA 152	Introduction to Management		2-0-2	GE – SS
CS 181	Applications of Information and Communication Technologies		2-0-2	GE-ICT
CS 181 L	Applications of Information and Communication Technologies Lab		0-1-1	
EL 170	Functional English		3-0-3	GE
HU 115	Pakistan Studies		2-0-2	GE
Total			15-1-16	

2 nd Semester				
Course Code	Course Title	Pre-req.	Cr. Hr.	Domain
SD 172	Foundations of Data Analytics		2-0-2	Major 2
SD 172 L	Foundations of Data Analytics Lab		0-1-1	
SD 112	Fundamentals of Probability Theory	SD 111	3-0-3	Major 3
SD 165	Statistical Tools and Analytics Programming		2-0-2	Major 4
SD 165 L	Statistical Tools and Analytics Programming Lab		0-1-1	
BA 353	Entrepreneurship		2-0-2	GE
MA 105	Multivariable Calculus	MA 116	3-0-3	GE-QR-2
PY 115	Introduction to Psychology		2-0-2	GE
FQ 100	Fehm-e-Quran I		0-1-1	GE
Total			14-3-17	

3rd Semester				
Course Code	Course Title	Pre-req.	Cr. Hr.	Domain
SD 222	Introduction to Sampling and Sampling Distribution	SD 112	3-0-3	Major – 5
SD 244	Bio Statistics and Population Analytics		3-0-3	Major – 6
SD 263	Exploratory Data Analytics and Visualization	SD 172	2-0-2	Major – 7
SD 263 L	Exploratory Data Analytics and Visualization Lab	SD 172 L	0-1-1	
CS 218	Advanced Programming	SD 165	2-0-2	IAC – 1
CS 218L	Advanced Programming Lab	SD 165 L	0-1-1	
HU 124	Islamic Studies & Ethics		2-0-2	GE
EL 271	Expository Writing	EL 170	3-0-3	GE
FQ 101	Fehm-e-Quran II	FQ 100	0-1-1	GE
Total			15-3-18	

4th Semester				
Course Code	Course Title	Pre-req.	Cr. Hr.	Domain
SD 276	Fundamentals of Artificial Intelligence		2-0-2	Major – 8
SD 276 L	Fundamentals of Artificial Intelligence Lab		0-1-1	
SD 246	Applied Econometrics		3-0-3	Major – 9
SD 277	Data Warehousing		2-0-2	Major – 10
SD 277 L	Data Warehousing Lab		0-1-1	
PH 112	Introduction to Environmental Science		3-0-3	GE
HU 411	Civics and Community Engagement		2-0-2	GE
HU 405	Ideology and Constitutional of Pakistan		2-0-2	GE
Total			14-2-16	

Internship				
	Course Title	Pre-req.	Cr. Hr.	Domain
SD 490	Internship (6-8 weeks)		03	Internship

5 th Semester				
Course Code	Course Title	Pre-req.	Cr. Hr.	Domain
SD 332	Estimation Theory		3-0-3	Major – 11
SD 348	Statistical Modelling: Linear & Generalized Linear Models		3-0-3	Major – 12
SD 375	Data Mining and Predictive Analytics		2-0-2	Major – 13
SD 375 L	Data Mining and Predictive Analytics Lab		0-1-1	
MA 201	Linear Algebra		3-0-3	IAC – 2
CS 217	Applied Data Structures	CS 218	2-0-2	IAC – 3
CS 217L	Applied Data Structures Lab	CS 218 L	0-1-1	
Total			13-2-15	

6 th Semester				
Course Code	Course Title	Pre-req.	Cr. Hr.	Domain
SD 344	Multivariate Data Analytics		3-0-3	Major – 14
SD 336	Bayesian Inference and Computational Methods		3-0-3	Major – 15
SD 3xx	Elective I		3-0-3	Major – 16
SD 366	Machine Learning for Data Analytics		2-0-2	Major – 17
SD 366 L	Machine Learning for Data Analytics Lab		0-1-1	
SD 334	Hypothesis Testing	SD 332	3-0-3	Major – 18
MA 478	Graph Theory		3-0-3	IAC – 4
Total			17-1-18	

7th Semester				
Course Code	Course Title	Pre-req.	Cr. Hr.	Domain
SD 4xx	Elective II		x-x-3	Major – 19
SD 4xx	Elective III		x-x-3	Major – 20
SD 467	Deep Learning for Data Analytics	SD 366	2-0-2	Major – 21
SD 467 L	Deep Learning for Data Analytics Lab	SD 366 L	0-1-1	
SD 445	Climate Analytics Using GIS Data		2-0-2	Major – 22
SD 445 L	Climate Analytics Using GIS Data Lab		0-1-1	
SD 4xx	Elective IV		x-x-3	Major – 23
SD 498	Capstone Project I		1-0-1	Capstone Project
Total			x-x-16	

8th Semester				
Course Code	Course Title	Prerequisite	Cr. Hr.	Domain
SD 4xx	Elective V		x-x-3	Major – 24
SD 478	Cloud Computing for Data Science		2-0-2	Major – 25
SD 478 L	Cloud Computing for Data Science Lab		0-1-1	
SD 4xx	Elective VI		x-x-3	Major – 26
SD 4xx	Elective VII		x-x-3	Major – 27
SD 499	Capstone Project-II	SD 498	2-0-2	Capstone Project
Total			x-x-14	

Total Credit Hours:	
BS Statistics and Data Analytical Science	133